

From: Page, Thurman  
Sent: Friday, March 21, 2003 3:00 PM  
T : STIC-Biotech/ChemLib  
Cc: Bertoglio, Valarie  
Subject: FW: SEQUENCE RUSH

Importance: High

RUSH SEARCH APPROVED BASED ON FILING DATE.

Examiner Bertoglio,  
Please send reasons with request. I assumed the rush is based on filing date.  
thanks

**Thurman K. Page**  
**SPE, Art Unit 1615**  
**Cm1- 2B01**  
**703-308-2927**

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MAR 21 2003  
STIC

-----Original Message-----

From: Bertoglio, Valarie  
Sent: Friday, March 21, 2003 2:57 PM  
To: Page, Thurman  
Cc: Chan, Christina; Hutzell, Paula  
Subject: FW: SEQUENCE RUSH

I would like to request a search of SEQ ID NO1 against the commercial protein databases for application 10/039645, first named inventor: Kopin, Alan

Valarie Bertoglio

Valarie Bertoglio  
Patent Examiner  
Art Unit 1632  
Room 12A16 CM1  
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POINT OF CONTACT:  
PAUL SCHULWITZ  
TECHNICAL INFO. SPECIALIST  
CM1 6B06 TEL. (703) 305-1954

TYPE OF SEARCH:		VENDOR/COST (where applic.)
Searcher: _____	NA Sequences: _____	STN: _____
Phone: _____	AA Sequences: _____	DIALOG: _____
Location: _____	Structures: _____	Questel/Orbit: _____
Date Picked Up: <u>3/25</u>	Bibliographic: _____	DRLink: _____
Date Completed: <u>3/25</u>	Litigation: _____	Lexis/Nexis: _____
Searcher Prep/Review: _____	Full text: _____	Sequence Sys.: _____
Clerical: _____	Patent Family: _____	WWW/Internet: _____
Online time: _____	Other: _____	Other (specify): _____



PS Disclosure, Page 190-194; 266pp; English.  
 XX A 365 bp fragment of the mouse delta opioid receptor was used to  
 CC screen a rat brain cDNA library under low stringency conditions.  
 CC One positive clone included the sequence given in AA089222, encoding a  
 CC mu opioid receptor, MOR-1 (AAR71964). MOR-1 was stably expressed in  
 CC transfected CHO cells.

XX Sequence 398 AA;

Query Match 100.0%; Score 2111; DB 16; Length 398;  
 Best Local Similarity 100.0%; Pred. No. 1,1e-223;  
 Matches 398; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 MDSSTGPTGNTSDCSDFLAQASCPAPGSMNLNLSHVQNSQDPCLNRTGLGNDSLCPQT 60  
 DB 1 MDSSTGPTGNTSDCSDFLAQASCPAPGSMNLNLSHVQNSQDPCLNRTGLGNDSLCPQT 60  
 QY 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVIVRYTQKATNIYIPNALADALATST 120  
 DB 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVIVRYTQKATNIYIPNALADALATST 120  
 QY 121 LPQSVYVLMGTWPGTILCKIVISIDYVNMFTSIPTLCTMSVDRIYVCHPVKALDPT 180  
 DB 121 LPQSVYVLMGTWPGTILCKIVISIDYVNMFTSIPTLCTMSVDRIYVCHPVKALDPT 180  
 QY 181 PRNKKIVNVCNWLSSAIGLPMVPMATTKYRQSIDCTLTFSHPYTWYENLLKICVPIFA 240  
 DB 181 PRNKKIVNVCNWLSSAIGLPMVPMATTKYRQSIDCTLTFSHPYTWYENLLKICVPIFA 240  
 QY 241 PIMPILITVYGLMLRLKSVRLSGSKEDKRNLRITRMVLVWVAVFVCMTPHIYV 300  
 DB 241 PIMPILITVYGLMLRLKSVRLSGSKEDKRNLRITRMVLVWVAVFVCMTPHIYV 300  
 QY 301 IIKALITIPETTFQVSMRFPCLALQYNSCLNPLVYALDENPKRCFRCFCIPTSSTIEQ 360  
 DB 301 IIKALITIPETTFQVSMRFPCLALQYNSCLNPLVYALDENPKRCFRCFCIPTSSTIEQ 360  
 QY 361 QNSTVRQNTREHPSTANTVDRTNHOLENLEATAPLP 398  
 DB 361 QNSTVRQNTREHPSTANTVDRTNHOLENLEATAPLP 398

RESULT 2  
 AA07864  
 ID AA07864 standard; Protein; 398 AA.

XX AA07864;  
 XX 14-NOV-2000 (first entry)  
 XX Amino acid sequence of a mu opioid receptor polypeptide.  
 XX mu opioid receptor; transcription regulatory polypeptide;  
 XX opiod receptor-like polypeptide.

XX Rattus sp.  
 XX US6103492-A.  
 XX 15-AUG-2000.  
 XX 07-JUL-1997; 97US-0889108.  
 XX 13-SEP-1994; 94US-0305518.  
 XX 08-MAR-1993; 93US-0056886.  
 XX 13-SEP-1993; 93US-0120601.  
 XX (INDV) UNIV INDIANA.  
 XX Yu L;  
 XX WPI; 2000-542550/49.

DR N-PSDB; AA59499.

XX Novel nucleic acids encoding mu opioid receptor for expressing large  
 PT quantities opioid receptors which are useful for screening and  
 PT evaluating subtype-selective drugs and as probes or primers -  
 XX Example 1; Column 91-94; 86pp; English.

XX The present sequence represents a mu opioid receptor protein. The  
 CC specification also describes a transmembrane region of the polypeptide  
 CC amino acid sequence. The polypeptide has an opiod receptor  
 CC polypeptides are useful as a source of probes and primers, which  
 CC may be used as diagnostic tools to detect normal and abnormal DNA  
 CC sequences in DNA derived from patients cells. They are also used as  
 CC a means for detecting and isolating other members of the polypeptide  
 CC family and related polypeptides from a DNA library potentially  
 CC containing such sequences. The polynucleotide is used for preparing  
 CC large quantities of opiod receptor which on expression in  
 CC microorganism can be useful for evaluating subtype-selective drugs.

XX Sequence 398 AA;

Query Match 100.0%; Score 2111; DB 21; Length 398;  
 Best Local Similarity 100.0%; Pred. No. 1,1e-223;  
 Matches 398; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 MDSSTGPTGNTSDCSDFLAQASCPAPGSMNLNLSHVQNSQDPCLNRTGLGNDSLCPQT 60  
 DB 1 MDSSTGPTGNTSDCSDFLAQASCPAPGSMNLNLSHVQNSQDPCLNRTGLGNDSLCPQT 60  
 QY 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVIVRYTQKATNIYIPNALADALATST 120  
 DB 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVIVRYTQKATNIYIPNALADALATST 120  
 QY 121 LPQSVYVLMGTWPGTILCKIVISIDYVNMFTSIPTLCTMSVDRIYVCHPVKALDPT 180  
 DB 121 LPQSVYVLMGTWPGTILCKIVISIDYVNMFTSIPTLCTMSVDRIYVCHPVKALDPT 180  
 QY 181 PRNKKIVNVCNWLSSAIGLPMVPMATTKYRQSIDCTLTFSHPYTWYENLLKICVPIFA 240  
 DB 181 PRNKKIVNVCNWLSSAIGLPMVPMATTKYRQSIDCTLTFSHPYTWYENLLKICVPIFA 240  
 QY 241 PIMPILITVYGLMLRLKSVRLSGSKEDKRNLRITRMVLVWVAVFVCMTPHIYV 300  
 DB 241 PIMPILITVYGLMLRLKSVRLSGSKEDKRNLRITRMVLVWVAVFVCMTPHIYV 300  
 QY 301 IIKALITIPETTFQVSMRFPCLALQYNSCLNPLVYALDENPKRCFRCFCIPTSSTIEQ 360  
 DB 301 IIKALITIPETTFQVSMRFPCLALQYNSCLNPLVYALDENPKRCFRCFCIPTSSTIEQ 360  
 QY 361 QNSTVRQNTREHPSTANTVDRTNHOLENLEATAPLP 398  
 DB 361 QNSTVRQNTREHPSTANTVDRTNHOLENLEATAPLP 398

RESULT 3  
 AAR76781  
 ID AAR76781 standard; Protein; 398 AA.

XX AAR76781;  
 XX 11-DEC-1995 (first entry)  
 XX Rat mu opiate receptor.  
 XX Mu opiate receptor; muOR; opiate agonist; opiate antagonist;  
 XX drug abuse; analgesic.  
 XX Rattus sp.  
 XX W09520667-A1.  
 XX 03-AUG-1995.

```

XX 30-JAN-1995; 95MO-US01144.
XX
XX 28-JAN-1994; 94US-0188275.
XX
XX (US9H) US DBPT HEALTH & HUMAN SERVICES.
XX (US9H) US SSC DEPT HEALTH.
XX
XX Johnson..95, P&Sico MM, Uhl G, Wang J;
XX
XX WPI; 1995-275452/36.
XX
XX New DNA encoding human mu opiate receptor - used esp. for screening
XX cpds. for activity as opiate agonists or antagonists
XX
XX Disclosure; Page 26-28; 49pp/#English.
XX
XX hMR cDNA was obt'd. from a human cerebral cortical cDNA library
XX screened with fragments of a rat mu opiate receptor. The encoded
XX protein showed homology to rat mu, delta and kappa opiate
XX receptors (AMN781-83).
XX
XX Sequence 398 AA;
XX
XX Query Match 100.0%; Score 2110; DB 16; Length 398;
XX Best Local Similarity 99.7%; Pred. No. 1.4e-223;
XX Matches 397; Conservative 1; Mismatches 0; Indels 0; Gaps 0;
XX
XX QY 1 MDSSTGPTGNTSCDPLAQCSPAPGSMNLNLSHYDQNSDPCQLNRTGLGNSLCPQT 60
XX DB 1 MDSSTGPTGNTSCDPLAQCSPAPGSMNLNLSHYDQNSDPCQLNRTGLGNSLCPQT 60
XX
XX QY 61 GSPSWTAITIALYSIVCVGLPGNPLVWYVIVRYTOMKTATNIYIPNALADALATST 120
XX DB 61 GSPSWTAITIALYSIVCVGLPGNPLVWYVIVRYTOMKTATNIYIPNALADALATST 120
XX
XX QY 121 LPQSVNYLNGTWMPPTGLCKIVISIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPT 180
XX DB 121 LPQSVNYLNGTWMPPTGLCKIVISIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPT 180
XX
XX QY 181 PRNAKIVNVCNMLSSAIGLPVMPNATTKYRQGSIDCTLTFSHPYWNENLLKICVPFPA 240
XX DB 181 PRNAKIVNVCNMLSSAIGLPVMPNATTKYRQGSIDCTLTFSHPYWNENLLKICVPFPA 240
XX
XX QY 241 PIMPLIITVCYGLMILKLSVRLSGSKKORNLRIETRMVLVVAVFVCMTPHIYV 300
XX DB 241 PIMPLIITVCYGLMILKLSVRLSGSKKORNLRIETRMVLVVAVFVCMTPHIYV 300
XX
XX QY 301 IIKALITIPPTPTVSMHFCIALGYTNSCLNPVLYAFDENPKRCPRFCIPTSTIEQ 360
XX DB 301 IIKALITIPPTPTVSMHFCIALGYTNSCLNPVLYAFDENPKRCPRFCIPTSTIEQ 360
XX
XX QY 361 QNSTVRONTREHPSNTANTVORTNHNLENLEASTAPLP 398
XX DB 361 QNSTVRONTREHPSNTANTVORTNHNLENLEASTAPLP 398
XX
XX RESULT 4
XX AAU96238
XX AC AAU96238;
XX AC AAU96238;
XX
XX 06-JUN-2000 (first entry)
XX
XX Ret mu-opioid receptor.
XX
XX Mammalian; Norway rat; PCR primer; methadone-specific opioid receptor;
XX psychotropic drug.
XX
XX Rattus norvegicus.
XX
XX US028175-A.

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XX 22-FEB-2000.
XX
XX 13-OCT-1998; 98US-0170331.
XX
XX 08-NOV-1993; 91US-0149093.
XX 15-AUG-1997; 97US-0911245.
XX
XX (UYOR-) UNIV ORBON HEALTH SCI.
XX
XX Civelli O, Bunzow JR, Grandy DK;
XX
XX WPI; 2000-194856/17.
XX
XX New isolated mammalian opioid receptor protein used for the development
XX of agents with pharmacological uses related to opioid receptors.
XX
XX Example 2; Fig 2; 26pp; English.
XX
XX The invention relates to a novel mammalian methadone-specific opioid
XX receptor (AY90493) especially isolated from Norway rats (Rattus
XX norvegicus). The rat coding sequence (AY90493) was isolated from
XX genomic DNA with the primer (AY90493-29104) and this sequence
XX was compared with the known sequences of the rat mu, delta and kappa
XX opioid receptors. The novel receptor protein can be used for the development of agents with
XX pharmacological uses related to the receptors e.g. psychotropic drugs.
XX
XX Sequence 398 AA;
XX
XX Query Match 98.3%; Score 2075; DB 21; Length 398;
XX Best Local Similarity 98.7%; Pred. No. 1e-219;
XX Matches 393; Conservative 1; Mismatches 4; Indels 0; Gaps 0;
XX
XX QY 1 MDSSTGPTGNTSCDPLAQCSPAPGSMNLNLSHYDQNSDPCQLNRTGLGNSLCPQT 60
XX DB 1 MDSSTGPTGNTSCDPLAQCSPAPGSMNLNLSHYDQNSDPCQLNRTGLGNSLCPQT 60
XX
XX QY 61 GSPSWTAITIALYSIVCVGLPGNPLVWYVIVRYTOMKTATNIYIPNALADALATST 120
XX DB 61 GSPSWTAITIALYSIVCVGLPGNPLVWYVIVRYTOMKTATNIYIPNALADALATST 120
XX
XX QY 121 LPQSVNYLNGTWMPPTGLCKIVISIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPT 180
XX DB 121 LPQSVNYLNGTWMPPTGLCKIVISIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPT 180
XX
XX QY 181 PRNAKIVNVCNMLSSAIGLPVMPNATTKYRQGSIDCTLTFSHPYWNENLLKICVPFPA 240
XX DB 181 PRNAKIVNVCNMLSSAIGLPVMPNATTKYRQGSIDCTLTFSHPYWNENLLKICVPFPA 240
XX
XX QY 241 PIMPLIITVCYGLMILKLSVRLSGSKKORNLRIETRMVLVVAVFVCMTPHIYV 300
XX DB 241 PIMPLIITVCYGLMILKLSVRLSGSKKORNLRIETRMVLVVAVFVCMTPHIYV 300
XX
XX QY 301 IIKALITIPPTPTVSMHFCIALGYTNSCLNPVLYAFDENPKRCPRFCIPTSTIEQ 360
XX DB 301 IIKALITIPPTPTVSMHFCIALGYTNSCLNPVLYAFDENPKRCPRFCIPTSTIEQ 360
XX
XX QY 361 QNSTVRONTREHPSNTANTVORTNHNLENLEASTAPLP 398
XX DB 361 QNSTVRONTREHPSNTANTVORTNHNLENLEASTAPLP 398
XX
XX RESULT 5
XX AAU96238
XX ID AAU96238 standard; Protein; 398 AA.
XX
XX AC AAU96238;
XX
XX 15-JUL-2002 (first entry)
XX
XX Ret mu opioid receptor.
XX
XX Rat; Class I G protein-coupled; receptor; mu opioid receptor;

```













AAV6887;  
 16-MAY-2000 (first entry)  
 A murine mu-opioid receptor splice variant MOR-1B 11.  
 Mu-opioid receptor; MOR-1; splice variant; morphine analgesia;  
 opiod-mediated ingestive response; opiod activity; analgesic;  
 gastrointestinal motility; respiration; immune system;  
 endocrine system; autonomous nervous system; peristalsis regulator;  
 body weight; neuroendocrine disorder; MOR-1B 11.  
 Mus sp.  
 Key Location/Qualifiers  
 Misc-difference 199 /note="encoded by COT"  
 WO200004046-A2.  
 27-JAN-2000.  
 15-JUL-1999; 99MO-US15974.  
 16-JUL-1998; 98US-0092980.  
 (SLOK ) SLOAN KETTERING INST CANCER RES.  
 Pasternak G, Pan Y;  
 WPI; 2000-182402/16.  
 N-PSDB; AAZ60725.  
 New splice variants of the mu-opioid receptor: useful in screening for  
 selective analgesics and for regulating morphine analgesia of body  
 weight -  
 Claim 17; Fig 3C; 83pp; English.  
 The present sequence represents a murine mu-opioid receptor (MOR-1)  
 splice variant MOR-1B 11. The specification describes 11 new exons for  
 the MOR-1 gene, which combine to yield 15 novel splice variants of  
 the MOR-1 gene. These splice variants are potential targets for  
 modulating morphine analgesia and opiod-mediated ingestive responses.  
 The MOR-1 polypeptide is used to screen compounds for opiod activity.  
 Such compounds are potential analgesics or more generally agents that  
 affect gastrointestinal motility, respiration or the immune, endocrine  
 or autonomous nervous systems, e.g. regulators of peristalsis  
 or autonomic nervous systems, e.g. regulators of peristalsis.  
 Antagonists, agonists and ligands of MOR-1, as well as DNA vectors  
 expressing MOR-1-encoding nucleic acids, or sequences antisense to  
 MOR-1 nucleic acids, are used to regulate morphine analgesia and body  
 weight. The level of MOR-1 or tissue distribution of MOR-1 can be  
 measured to diagnose MOR-1 related pharmacological abnormalities or  
 neuroendocrine disorders, particularly inherited disorders. Transgenic  
 animals with extra copies of the MOR-1 gene, or with endogenous alleles  
 deleted, are used to study loss or gain of function phenotypes.

Query Match 94.9%; Score 2003; DB 21; Length 409;  
 Best Local Similarity 97.4%; Pred. No. 9.3e-212;  
 Matches 376; Conservative 3; Mismatches 7; Indels 0; Gaps 0;  
 OY 1 MDSGTGPTSDSDPLAASCPAGSWSLNSHVQNSDPCGLNRTGLGNSLCPQT 60  
 DB 1 MDSBAGPNTSDSDPLAASCPAGSWSLNSHVQNSDPCGPNRTGLGNSLCPQT 60  
 OY 61 GSPSWATITMAYLSVCVGLFGNPLVMYVIRYTKMTATNIIYIPNALADALST 120  
 DB 61 GSPSWATITMAYLSVCVGLFGNPLVMYVIRYTKMTATNIIYIPNALADALST 120  
 OY 121 LPQSVNYLWGTWPGTILCKIVISIDYVNMPTSIFTLCTNSVDRIYAVCHPVKALDPT 180

DB 121 LPQSVNYLWGTWPGTILCKIVISIDYVNMPTSIFTLCTNSVDRIYAVCHPVKALDPT 180  
 OY 181 PRNAKIVNVCNMLSSAIGLPNMPMATTYQSGSIDCTLTFSHPMTWNLKICVPIFA 240  
 DB 181 PRNAKIVNVCNMLSSAIGLPNMPMATTYQSGSIDCTLTFSHPMTWNLKICVPIFA 240  
 OY 241 FIMPILITVCVGLMILKSLVMSLSSKORNLRIIRIMLVVAVIYVCMTPPIHYV 300  
 DB 241 FIMPVLITVCVGLMILKSLVMSLSSKORNLRIIRIMLVVAVIYVCMTPPIHYV 300  
 OY 301 IIKALITIPETPTQVWHFCALGYTNSCLNPLVYAFJDNFPCPCPFCIPTSSTIEQ 360  
 DB 301 IIKALITIPETPTQVWHFCALGYTNSCLNPLVYAFJDNFPCPCPFCIPTSSTIEQ 360  
 OY 361 QNSSTRVQNTREHSTANTVDRTHQ 386  
 DB 361 QNSAIRQNTREHSTANTVDRTHQ 386  
 RESULT 14  
 AA168877;  
 AD AAV68877 standard; Protein; 438 AA.  
 AC AAV68877;  
 DT 16-MAY-2000 (first entry)  
 DX A murine mu-opioid receptor splice variant MOR-1C.  
 Mu-opioid receptor; MOR-1; splice variant; morphine analgesia;  
 opiod-mediated ingestive response; opiod activity; analgesic;  
 gastrointestinal motility; respiration; immune system;  
 endocrine system; autonomous nervous system; peristalsis regulator;  
 body weight; neuroendocrine disorder; MOR-1C.  
 Mus sp.  
 WO200004046-A2.  
 27-JAN-2000.  
 15-JUL-1999; 99MO-US15974.  
 16-JUL-1998; 98US-0092980.  
 (SLOK ) SLOAN KETTERING INST CANCER RES.  
 Pasternak G, Pan Y;  
 WPI; 2000-182402/16.  
 N-PSDB; AAZ60725.  
 New splice variants of the mu-opioid receptor: useful in screening for  
 selective analgesics and for regulating morphine analgesia of body  
 weight -  
 Claim 5; Fig 3A; 83pp; English.  
 The present sequence represents a murine mu-opioid receptor (MOR-1)  
 splice variant MOR-1C. The specification describes 11 new exons for  
 the MOR-1 gene, which combine to yield 15 novel splice variants of  
 the MOR-1 gene. These splice variants are potential targets for  
 modulating morphine analgesia and opiod-mediated ingestive responses.  
 The MOR-1 polypeptide is used to screen compounds for opiod activity.  
 Such compounds are potential analgesics or more generally agents that  
 affect gastrointestinal motility, respiration or the immune, endocrine  
 or autonomous nervous systems, e.g. regulators of peristalsis  
 or autonomic nervous systems, e.g. regulators of peristalsis.  
 Antagonists, agonists and ligands of MOR-1, as well as DNA vectors  
 expressing MOR-1-encoding nucleic acids, or sequences antisense to  
 MOR-1 nucleic acids, are used to regulate morphine analgesia and body  
 weight. The level of MOR-1 or tissue distribution of MOR-1 can be  
 measured to diagnose MOR-1 related pharmacological abnormalities or  
 neuroendocrine disorders, particularly inherited disorders. Transgenic



GenCore version 5.1.4\_p5\_4578  
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OM protein - protein search, using sw model

```
Run on: ..... March 25, 2003, 09:55:58 ; Search time 23 Seconds
              (without alignment)
              1663.543 Million cell updates/sec
```

Title: US-10-039-645-1  
 Perfect score: 2111  
 Sequence: 1 MDSSGTGGTSTDCSDPLAC.....TVDRTNHOLENLEAETAPLP 398

Scoring table: BLOSUM62  
Gapop 10.0 , Gapext 0.5

Searched: 283224 seqs, 96134422 residues

Total number of hits satisfying chosen parameters: 283224

```
Minimum DB seq length: 0
Maximum DB seq length: 2000000000
```

Post-processing: Minimum Match 0%  
Maximum Match 100%  
Listing first 45

```
Database :      PIR_73:
1: p1r1:
2: p1r2:
3: p1r3:
4: p1r4:
```

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

## SUMMARIES

Result	Query No.	Score	Match	Length	DB ID	Description
1	211	100.0	398	2	156517	mu opioid receptor
2	2101	99.5	398	2	156517	mu opioid receptor
3	2063	97.7	398	2	A57510	mu opioid receptor
4	1999	94.7	400	2	156553	mu opiate receptor
5	1936	91.7	392	2	861693	opioid receptor mu
6	1171.5	55.5	373	2	J80087	delta opioid recep
7	1147.5	54.4	372	2	J38532	delta opioid recep
8	1146.5	54.3	372	2	K49227	delta opioid recep
9	1141.5	54.1	380	2	A35259	kappa opioid recep
10	1139.5	54.0	372	2	K34592	kappa opioid recep
11	1133	53.5	380	2	Q73138	kappa opioid recep
12	1126	52.5	380	2	K49227	kappa opioid recep
13	1117	52.9	380	2	JC3434	kappa opioid recep
14	977	46.3	367	2	156520	G protein-coupled
15	976.5	46.3	370	2	843087	orphan opioid rece
16	974	46.1	367	2	JC2421	opioid receptor ho
17	973	46.1	367	2	149022	kappa opioid recep
18	693	32.8	391	2	A33297	smactostatin recep
19	691	32.7	391	2	C41795	smactostatin recep
20	689.5	32.7	391	2	A41795	smactostatin recep
21	689.5	32.7	391	2	A41795	smactostatin recep
22	683	32.4	369	2	D41795	smactostatin recep
23	678	32.1	389	2	A45291	smactostatin recep
24	670	31.7	364	2	Q73249	brain-specific som
25	668	31.6	384	2	Q73249	smactostatin recep
26	665	31.4	342	2	832848	smactostatin recep
27	662	31.4	384	2	JC4629	smactostatin recep
28	659.5	31.2	388	2	JN0605	smactostatin recep
29	659	31.2	369	2	B41795	smactostatin recep

## ALIGNMENTS

## RESULT 1

156517  
mu oploid receptor - rat  
C.Species: Rattus norvegicus (Norway rat)  
C.Date: 26-Jul-1996  
Sequence revision 26-Jul-1996 #test\_change 20-Jun-2000  
C.CC: D26-101-1996  
Accession: 156517; 157951; A49680; 152314; 834593; A48799; 150154  
J.R.; Zhang, G.; Bouvier, C.; Saez, C.; Rommkleiv, O.K.; Kelly, M.J.; Grand  
S.J. Neurochem. 64, 14-24, 1995  
A.Title: Characterization and distribution of a cloned rat mu-opioid receptor.  
A.Reference number: 156517; MUID:9506825; PMID:779806  
A.Accession: 157951; MUID:9506825; PMID:779806  
A.Molecule type: mRNA  
A.Molecule type: translated from GB/EMBL/DBJ  
A.Residues: 1-398 <RES>  
A.Cross-references: EMBL:U02083; NID:G403573; PIDN:AAA70049.1; PID:G403574  
J.Chen, Y.; Mestok, A.; Liu, J.; Hurley, J.A.; Yu, L.  
Mol. Pharmacol. 44, 8-12, 1993  
A.Title: Molecular cloning and functional expression of a mu-opioid receptor from rat  
A.Reference number: 157951; MUID:93341493; PMID:839325  
A.Accession: 157951  
A.Molecule type: mRNA  
A.Molecule type: translated from GB/EMBL/DBJ  
A.Residues: 1-398 <RES>  
A.Cross-references: GB:13069; NID:G348250; PIDN:AAA41630.1; PID:G348251  
J.D.; Wang, J.B.; Johnson, B.; Corbett, M.; Luchin, D.R.; Uhl,  
S.J. Biol. Chem. 268, 26447-26451, 1993  
A.Title: Purification and partial amino acid sequence of a mu oploid receptor from rat  
A.Reference number: A49680; MUID:94075333; PMID:8253772  
A.Accession: A49680  
A.Molecule type: mRNA  
A.Molecule type: translated from NCBI backbone (NCBIP:140841)  
S.J. Ramakrishnan, S.; Elde, R.; Loh, H.H.  
Commun. 209, 563-574, 1995  
A.Title: Complementary DNA cloning of a mu-opioid receptor from rat peritoneal macrophroph  
A.Reference number: 152314; MUID:95251654; PMID:7733926  
A.Accession: 152314  
A.Molecule type: mRNA  
A.Molecule type: preliminary  
A.Residues: 101-340 <SED>  
A.Cross-references: GB:S77863; NID:G998526  
S. Sprague Dawley, peritoneal macrophages  
R. P. Kudo, K.; Mori, K.; Nishitani, H.  
FEBS Lett. 347, 311-314, 1993  
A.Title: Cloning and expression from cDNAs of rat oploid receptor delta-an  
A.Reference number: 834594; MUID:93331552; PMID:8394245  
A.Accession: 834593  
A.Molecule type: mRNA  
A.Molecule type: 1-244, 'V', 246-398 <FUK>  
A.Cross-references: GB:D16349; NID:G391866; PIDN:BA003852.1; PID:G391867

**Query Match** 99.5% Score 2101, DB 2, Length 398;  
Best Local Similarity 99.5%; Pred. No. 2,76-169;  
Matches 396, Conservative 1, Mismatches 1, Indels 0, Gaps 0;

Oy 1 MOSSTGRTSDCSDDPLAQASCSPAGSNLNSHVDGNQSDPCCGLARTGNGNDSLCPT 60  
Db 1 MOSSTGRTSDCSDDPLAQASCSPAGSNLNSHVDGNQSDPCCGLARTGNGNDSLCPT 60  
Oy 61 GSPEWNTATITMALYSIVCVGLFONPLVMTYVRYTKMTATNIYNFLADALATST 120  
Db 61 GSPEWNTATITMALYSIVCVGLFONPLVMTYVRYTKMTATNIYNFLADALATST 120  
Oy 121 LPPOSVNVLKMGTPPTILCKIVISIDYNNMFTSIPTCLTMSVDRIACHPVKALDPT 180  
Db 121 LPPOSVNVLKMGTPPTILCKIVISIDYNNMFTSIPTCLTMSVDRIACHPVKALDPT 180  
Oy 181 PRNKIYVNCWLISASGLPWPMATTKYRGSIDCTLTFSHPYMYENLLKICVPFA 240  
Db 181 PRNKIYVNCWLISASGLPWPMATTKYRGSIDCTLTFSHPYMYENLLKICVPFA 240  
Oy 241 FIMPLLIIITVCGLMLRLSKVSVMLSGSKVKDNLRIRTRVLVVAVVICWTPIHYV 300  
Db 241 FIMPLLIIITVCGLMLRLSKVSVMLSGSKVKDNLRIRTRVLVVAVVICWTPIHYV 300  
Oy 301 IKALITIPETTTQTVSMHFCAIGTYNSCLNPVLYAFDENFKRCFRFCPTSTSTIQ 360  
Db 301 IKALITIPETTTQTVSMHFCAIGTYNSCLNPVLYAFDENFKRCFRFCPTSTSTIQ 360  
Oy 361 QNSTRVQNTREHPSNTANTVDNRHOLENLASTAPLP 398  
Db 361 QNSTRVQNTREHPSNTANTVDNRHOLENLASTAPLP 398

**RESULT 3**  
**A57510**

C:Species: Mus musculus (house mouse)  
C>Date: 08-Dec-1995 Sequence revision 08-Dec-1995 #text\_change 24-Nov-1999  
C/Accession: A57510; I48665; S66513; I49300  
R/Kaufman, D.L.; Keith Jr., D.E.; Anton, B.; Tian, J.; Magendzo, K.; Newman, D.; Tran,  
J. Biol. Chem. 270, 15877-15883, 1995  
A>Title: Characterization of the murine mu opioid receptor gene.  
A/Reference number: A57510; MUID:95318184; PMID:779593  
A/Accession: A57510  
A/Molecule type: mRNA  
A/Molecule type: mRNA  
A/Residues: 1-398 <KAU>  
A/Cross-references: GB:IU9380  
R/Min, B.H.; Augustin, L.B.; Felaheim, R.P.; Fuchs, J.A.; Loh, H.H.  
Proc. Natl. Acad. Sci. U.S.A. 91, 9081-9085, 1994  
A>Title: Genomic structure analysis of promoter sequence of a mouse mu opioid receptor:  
A/Reference number: I48665; MUID:94377496; PMID:8090773  
A/Accession: I48665  
A/Status: translated from GB/EHBL/DDBJ  
A/Molecule type: mRNA  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
R/Rossi, G.C.; Pan, Y.X.; Brown, G.P.; Pasternak, G.W.  
PNAS Lett. 369, 192-196, 1995  
A>Title: Antisense mapping the MOR-1 opioid receptor: evidence for alternative splicing  
A/Reference number: I49300; MUID:95377399; PMID:7649256  
A/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
R/Rossi, G.C.; Pan, Y.X.; Brown, G.P.; Pasternak, G.W.  
PNAS Lett. 369, 192-196, 1995  
A>Title: Antisense mapping the MOR-1 opioid receptor: evidence for alternative splicing  
A/Reference number: I49300; MUID:95377399; PMID:7649256  
A/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown  
A/Molecule type: mRNA  
A/Residues: 1-398 <ROS>  
A/Cross-references: EMBL:U0561; NID:g555696; PIDN:AAB6064g.1; PID:g5565069  
A/Note: The nucleotide sequence was submitted to the EMBL Data Library, November 1995  
C/Accession: S66513  
A/Status: nucleic acid sequence not shown; translation not shown

Query Match 97.7%, Score 3063; DB 2; Length 398;  
Best Local Similarity 97.5%; Pred. No. 4,36-166;  
Matches 388; Conservative 3; Mismatches 7; Indels 0; Gaps 0;

Qy 1 MDSSTGQNTSDSCDPLAQASCPAPSGPWSLHVQDQSDPGNLTGSGDLSLCPOT 60  
Db 1 MDSAGPQSDSCDPLAQASCPAPSGPWSLHVQDQSDPGNLTGSGDLSLCPOT 60  
Qy 61 GSPSMTATITMALYSIVCVGLPQNFVIVVIRVTKNTATNIYIPNLADALATST 120  
Db 61 GSPSMTATITMALYSIVCVGLPQNFVIVVIRVTKNTATNIYIPNLADALATST 120  
Qy 121 LPPQSVNVLKMTGPPPTLCKIVISIDYNNMFTSIPTLCTNSVDVRIAVCHPVKALDPT 180  
Db 121 LPPQSVNVLKMTGPPPTLCKIVISIDYNNMFTSIPTLCTNSVDVRIAVCHPVKALDPT 180  
Qy 181 PRNAXIVVNCMLSSAIGLPVMPATTKYRQSGIDCTLTFSHPPTWENLLKICVPIPA 240  
Db 181 PRNAXIVVNCMLSSAIGLPVMPATTKYRQSGIDCTLTFSHPPTWENLLKICVPIPA 240  
Qy 241 FMPILITVTCGLMILRLKLSVRLSGSKEDKNLRLIRTMVLVVAVFVTCVTPHI 300  
Db 241 FMPILITVTCGLMILRLKLSVRLSGSKEDKNLRLIRTMVLVVAVFVTCVTPHI 300  
Qy 301 IIKALITIPETTPQTVSMHPCFALGVYAPLDENPKRCFPCPTSTSTEQ 360  
Db 301 IIKALITIPETTPQTVSMHPCFALGVYAPLDENPKRCFPCPTSTSTEQ 360  
Qy 361 QNSVTRVQNTREHPSTANTVORTNHOENLEATAPLP 398  
Db 361 QNSVTRVQNTREHPSTANTVORTNHOENLEATAPLP 398

RESULT 4  
156553  
W:Alteinate receptor - human  
C:Species: Homo sapiens (man)  
C>Date: 02-Jul-1996 #sequence\_revision 02-Jul-1996 #text\_change 19-May-2000  
C/Accession: 156553; A38991; E41075; S51215  
R:Meete, A.; Hurley, J.H.; Bye, L.S.; Campbell, A.D.; Chen, Y.; Tian, M.; Liu, J.; Schu  
J. Neurosci. 15, 2396-2406, 1995  
A>Title: The human mu opioid receptor: modulation of functional desensitization by calci  
A/Reference number: 156553; PMID:95198115; PMID:7891175  
A/Accession: 156553  
A/Status: nucleic acid sequence not shown; translated from GB/EMBL/DBJ  
A/Molecule type: mRNA  
A/Accession: 156553  
A/Reference number: 156553; PMID:95198115; PMID:7891175  
R:Wang, J.B.; Johnson, P.B.; Petralio, A.M.; Hawkins, A.L.; Griffin, C.A.; Uhl, G.R.  
submitted to GenBank, August 1994  
A/Accession: A38991  
A/Status: translated from GB/EMBL/DBJ  
A/Molecule type: mRNA  
A/Residues: 1-50; 'N', 52-233; 'V', 235-400 <MAN>  
A/Cross-references: GB:L25301; NID:9459831; PIDN:AAA73958.1; PID:9459832  
R:Wang, J.B.; Johnson, P.B.; Petralio, A.M.; Hawkins, A.L.; Griffin, C.A.; Uhl, G.R.  
FEBS Lett. 338, 217-222, 1994  
A/Title: Human mu opioid receptor: cDNA and genomic clones, pharmacologic characterizat  
A/Accession: 841075  
A/Reference number: 841075; PMID:94139928; PMID:7905839  
A/Status: nucleic acid sequence not shown  
A/Molecule type: mRNA  
A/Residues: 1-50; 'N', 52-400 <MAN>  
R:Bare, L.A.; Mansson, E.; Yang, D.  
FEBS Lett. 354, 213-216, 1994  
A/Title: Expression of two variants of the human mu opioid receptor mRNA in SK-N-SH cell  
A/Accession: S51215  
A/Reference number: 851215; PMID:95046336; PMID:7957926  
A/Status: Preliminary  
A/Molecule type: mRNA  
A/Residues: 387-400 <BAR>

Query Match 91.7%; Score 1936; DB 2; Length 392;  
Best Local Similarity 92.3%; Pred. No. 2,16-155;

C/Genetics:  
A:Gene: GDB:OPRM1  
A:Cross-references: GDB:137216; OMIM:600018  
A:Map position: 6Q24-6Q25  
C:Superfamily: vertebrate rhodopsin  
C:Keywords: G protein-coupled receptor; glycoprotein; transmembrane protein  
P:71-96/Domain: transmembrane #status predicted <TM1>  
P:107-132/Domain: transmembrane #status predicted <TM2>  
P:148-165/Domain: transmembrane #status predicted <TM3>  
P:181-204/Domain: transmembrane #status predicted <TM4>  
P:236-257/Domain: transmembrane #status predicted <TM5>  
P:283-304/Domain: transmembrane #status predicted <TM6>  
P:323-342/Domain: transmembrane #status predicted <TM7>  
P:312,33,40,48/Binding site: carbohydrate (Aan) (covalent) #status predicted  
P:9,12,33,40,48/Binding site: carbohydrate (Aan) (covalent) #status predicted

Query Match 94.7%; Score 1999; DB 2; Length 400;  
Best Local Similarity 93.8%; Pred. No. 1,16-160;  
Matches 375; Conservative 11; Mismatches 12; Indels 2; Gaps 1;

Qy 1 MDSSTGQNTSDSCDPLAQASCPA--POSWHLHVQDQSDPGNLTGSGDLSLCPOT 58  
Db 1 MDSAPTNASCTTDLA16SCSPAPSGPWSLHVQDQSDPGNLTGSGDLSLCP 60  
Qy 59 OTGSPSMVTAITMALYSIVCVGLPQNFVIVVIRVTKNTATNIYIPNLADALAT 118  
Db 61 PTGSPSMITAITMALYSIVCVGLPQNFVIVVIRVTKNTATNIYIPNLADALAT 120  
Qy 119 STLPQSVNVLKMTGPPPTLCKIVISIDYNNMFTSIPTLCTNSVDVRIAVCHPVKALD 178  
Db 121 STLPQSVNVLKMTGPPPTLCKIVISIDYNNMFTSIPTLCTNSVDVRIAVCHPVKALD 180  
Qy 179 RFPNAXIVVNCMLSSAIGLPVMPATTKYRQSGIDCTLTFSHPPTWENLLKICVPI 238  
Db 181 RFPNAXIVVNCMLSSAIGLPVMPATTKYRQSGIDCTLTFSHPPTWENLLKICVPI 240  
Qy 239 PAPTPIILITVTCGLMILRLKLSVRLSGSKEDKNLRLIRTMVLVVAVFVTCVTPHI 298  
Db 241 PAPTPIILITVTCGLMILRLKLSVRLSGSKEDKNLRLIRTMVLVVAVFVTCVTPHI 300  
Qy 299 VYIKALITIPETTPQTVSMHPCFALGVYAPLDENPKRCFPCPTSTSTEQ 358  
Db 301 VYIKALITIPETTPQTVSMHPCFALGVYAPLDENPKRCFPCPTSTSTEQ 360  
Qy 359 EQNSVTRVQNTREHPSTANTVORTNHOENLEATAPLP 398  
Db 361 EQNSVTRVQNTREHPSTANTVORTNHOENLEATAPLP 400

RESULT 5  
S65693  
opioid receptor mu variant MOR1A - human  
C:Species: Homo sapiens (man)  
C>Date: 12-Jul-1996 #sequence\_revision 26-Jul-1996 #text\_change 05-Nov-1999  
C/Accession: S65693; S51216  
R:Bare, L.A.; Mansson, E.; Yang, D.  
submitted to the EMBL Data Library, July 1994  
A/Description: Expression of two variants of the human mu opioid receptor mRNA in SK-  
A/Reference number: S65693  
A/Accession: S65693  
A/Molecule type: mRNA  
A/Residues: 1-392 <BAR>  
A/Cross-references: EMBL:U12569; NID:9607911; PIDN:AA860354.1; PID:9607912  
R:Bare, L.A.; Mansson, E.; Yang, D.  
FEBS Lett. 354, 213-216, 1994  
A/Title: Expression of two variants of the human mu opioid receptor mRNA in SK-N-SH c  
A/Reference number: 851215; PMID:95046336; PMID:7957926  
A/Accession: S51216  
A/Molecule type: mRNA  
A/Residues: 387-392 <BAR>  
C:Superfamily: vertebrate rhodopsin

QY 360 QONSTRVQNTRE 372  
DB 345 QSNLWLNRYNATRE 357

RESULT 7  
delta oploid receptor - human  
138532  
C:Species: Homo sapiens (man)  
C:Date: 29-May-1998 #sequence\_revision 29-May-1998 #text\_change 21-Jul-2000  
C:Accession: 138532; 138657  
C:Reference: K.J.; Malacynska, B.; Pang, L.; Xiaoping, L.; Nguyen, M.; Santoro, G.; Varga, L.; et al. (1998) Cloning and expression of human delta oploid receptor. Cloning and expression. 138532, NID:94260835, PMID:8201839  
A:Reference number: 138532, NID:94260835, PMID:8201839  
A:Accession: 138532  
A:Status: preliminary; translated from GB/EMBL/DBDJB  
A:Status: preliminary; translated from GB/EMBL/DBDJB  
A:Molecule type: mRNA  
A:Molecule type: mRNA  
A:Residues: 1-372 <NA>  
A:Cross-references: EMBL:U07882; NID:9457313; PIDN:AAA18789.1; PID:9497314  
R:R.Simonin, F.; Bafort, K.; Gaveriaux-Ruff, C.; Matthes, H.; Nappay, V.; Lanneke, B.; M. Mol. Pharmacol. 46, 1015-1021, 1994  
A:Title: The human delta oploid receptor: genomic organization, cDNA cloning, function, and expression. 138532, NID:94260835, PMID:8201839  
A:Reference number: 138532, NID:94260835, PMID:8201839  
A:Accession: 138532  
A:Status: preliminary; translated from GB/EMBL/DBDJB  
A:Molecule type: mRNA  
A:Residues: 1-367  
A:Cross-references: EMBL:U10504; NID:G501144; PIDN:AAA83456.1; PID:G501145  
C:Genetics:  
GDB:OPR41  
A:Cross-references: GDB:137215; OMIM:165195  
A:Map position: 1p36.1-1p34.3  
A:Superfamily: vertebrate rhodopsin

Query Match 54.4% Score 1147.5 DB 2 Length 372;  
Best Local Similarity 63.0% Pval NO 4.9e-89;  
Matches 226; Conservative 37; Mismatches 93; Indels 3; Gaps 3;

QY 24 PAPGSNGLNS-HVQNGSDPGLNRTGLGNDLSLCPOTGS-PSKMTATTIMALYSIVCVV 81  
DB 3 PAPSAGAELOPPLPANASDAYPSPAGSAGANASGPPQSGASSLALATATLYSAVCAV 62  
QY 82 GLPGNFWLVVYRYTMTKATNIYIFNLADALATSTLPFOSVNVYLMGTWPPPTILCK 141  
DB 6 GLGVNFWPGVIRYRYTMTKATNIYIFNLADALATSTLPFOSKATLYSAVCAV 122  
QY 142 IVTSDYNNMPTSLTLCSTVDSDVIAVCHPVKALDPTPRNKAVYCNWLTLSATCLP 201  
DB 123 AVLSIDYNNMPTSLTLCSTVDSDVIAVCHPVKALDPTPRNKAVYCNWLTLSATCLP 182  
QY 202 VMFMATKTRQSGIDCTLTSHPTWYNNELKICVFAPIMPLIITVCYGLMILRLAS 261  
DB 183 IMYNAVTRPDGAVVCHQPPSGSNYMDVTIKVFLFAPVPLIILITVCYGLMILRLAS 242  
QY 262 VRLGSGSKDNRURITRVLVVAVPIVCTMTHIYIKALITLITPTPTQFVSMR 320  
DB 243 VRLGSGSKDNRURITRVLVVAVPIVCTMTHIYIKALITLITPTPTQFVSMR 302  
QY 321 CTALGYTNCLNPLVAFLDENPKRCBPICPTSGTISQONSTRVQNTREHPSTANT 379  
DB 303 CTALGYTNCLNPLVAFLDENPKRCBPICPTSGTISQONSTRVQNTREHPSTANT 361

RESULT 8  
delta oploid receptor 1 - mouse  
948227  
C:Species: Mus musculus (house mouse)  
C:Date: 26-May-1994 #sequence\_revision 26-May-1994 #text\_change 24-Nov-1999  
C:Accession: M48227, S57807, S48683, S56745  
C:Reference: K.; Raynor, K.; Kong, H.; Greider, C.D.; Takeda, J.; Reisine, T.; Bell, G.I.; Yanuka, K.; et al. (1993) Cloning and expression of human delta oploid receptor. Cloning and expression. 138532, NID:94260835, PMID:8201839  
A:Reference number: 138532, NID:94260835, PMID:8201839  
A:Accession: 138532  
A:Status: preliminary; translated from GB/EMBL/DBDJB  
A:Status: preliminary; translated from GB/EMBL/DBDJB  
A:Molecule type: mRNA  
A:Molecule type: mRNA  
A:Residues: 1-372 <NA>  
A:Cross-references: EMBL:U07882; NID:9457313; PIDN:AAA18789.1; PID:9497314  
R:R.Simonin, F.; Bafort, K.; Gaveriaux-Ruff, C.; Matthes, H.; Nappay, V.; Lanneke, B.; M. Mol. Pharmacol. 46, 1015-1021, 1994  
A:Title: The human delta oploid receptor: genomic organization, cDNA cloning, function, and expression. 138532, NID:94260835, PMID:8201839  
A:Reference number: 138532, NID:94260835, PMID:8201839  
A:Accession: 138532  
A:Status: preliminary; translated from GB/EMBL/DBDJB  
A:Molecule type: mRNA  
A:Residues: 1-367  
A:Cross-references: EMBL:U10504; NID:G501144; PIDN:AAA83456.1; PID:G501145  
C:Genetics:  
GDB:OPR41  
A:Cross-references: GDB:137215; OMIM:165195  
A:Map position: 1p36.1-1p34.3  
A:Superfamily: vertebrate rhodopsin

N/Alternate names: dynorphin receptor  
C/Species: Cavia porcellus (guinea pig)  
C/Date: 06-Feb-1995 #sequence\_revision 06-Feb-1995 #text\_change 24-Nov-1999  
C/Accession: A55259  
R/Xie, G.; Meng, F.; Mansour, A.; Thompson, R.C.; Hoversten, M.T.; Goldstein, A.; Wat  
Proc. Natl. Acad. Sci. U.S.A. 91, 3779-3783, 1994  
A/Title: Primary structure and functional expression of a guinea pig kappa opioid (dy  
A/Reference number: A55259; MUID:94224825; PMID:8170367  
A/Accession: A55259  
A/Status: preliminary  
A/Molecule type: mRNA  
A/Residues: 1-380 <K18>  
A/Cross-references: GB:U04092; NID:9476106; PIDN:AAA67171.1; PID:9476107  
C/Superfamily: vertebrate rhodopsin  
C/Keywords: transmembrane protein

Query Match 54.1%; Score 1141.5; DB 2; Length 380;  
Best Local Similarity 60.3%; Pred. No. 1.6e-88;  
Matches 226; Conservative 35; Mismatches 75; Indels 19; Gaps 7;

QY 16 PLAAQSCSPARGSWL-NLSHVDGNQSDPCGLNRGLGG--NDSLCPTGSPGSMVTAITIM 72  
DB 16 PARNACLLPNSGAWLPQWAEFDGN-----GSAGPQDEQLRPAHISPAIPVIT-- 63

QY 73 ALYSIVCVVGLFQNFPLVMTVIVYVTKMTATNIYIPNLALADALATSLPFSQSVNYLMQT 132  
DB 64 AVSVVVFVGLVQNSLVMPVIRVTKMTATNIYIPNLALADALVTTMPQSTVYLMNS 123

QY 133 WPTILCKIVISIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPTPRNAKIVNVCNM 192  
DB 124 WPTDVLCKIVISIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPTPRNAKIVNVCNM 183

QY 193 ILASALGLPMPKATTVYQ--GSIDCTLFSHPTM--YENLXICVETPARIMPLIIT 249  
DB 184 LLSSVGLI6A1LIGCTVREVDVIECSLQFPDDDSWDLPMKICVFPVPIVLI 243

QY 250 VCYGLMLRLKSVMLSGSKERDNRIRTRVVLVAVVAVVCTVPIHVIKALITIP 309  
DB 244 VCYTLMRLKSVMLSGSKERDNRIRTRVVLVAVVAVVCTVPIHVIKALITIP 303

QY 310 ETTFVTHMPCIALGYTNSCLNPLVYAPLDENPFCRPFCTPTSTISQONSTRVRON 369  
DB 304 HSTAAUSSYFICALGYTNSCLNPLVYAPLDENPFCRPFCTPTSTISQONSTRVRON 362

QY 370 TREPSTANTVORTN 384  
DB 363 TVQDPAYRNVQVW 377

RESULT 10  
S34592  
C/Species: Rattus norvegicus (Norway rat)  
C/Date: 10-Dec-1993 #sequence\_revision 10-Nov-1995 #text\_change 10-Jun-2000  
C/Accession: S34592; I56571  
R/Fukuda, K.; Kato, S.; Mori, K.; Nishi, M.; Takekuma, H.  
Mol. Cell. Neurosci. 12, 311-324, 1999  
A/Title: Primary structure and expression from cDNA of rat opioid receptor, delta-a  
A/Reference number: S34592; MUID:93551652; PMID:8394245  
A/Accession: S34592  
A/Molecule type: mRNA  
A/Residues: 1-372 <PUC>  
A/Cross-references: GB:D16348; NID:9391864; PIDN:BA001851.1; PID:9391865  
R/Aboud, M.B.  
J. Neurosci. Res. 27, 714-719, 1994  
A/Title: Molecular cloning and expression of a rat delta opioid receptor from rat bra  
A/Reference number: I56571  
A/Accession: I56571  
A/Status: preliminary; translated from GB/EMBL/DBJ  
A/Molecule type: mRNA  
A/Residues: 1-372  
A/Cross-references: EMBL:U00475; NID:9403488; PIDN:AAA19939.1; PID:9514211  
C/Genetics:

A/Title: Cloning and functional comparison of kappa and delta opioid receptors from moud  
A/Reference number: A48227; MUID:93342064; PMID:8393575  
A/Accession: A48227  
A/Status: preliminary  
A/Molecule type: mRNA  
A/Residues: 1-372 <YAS>  
A/Cross-references: GB:U11064; NID:9348246; PIDN:AAA3750.1; PID:9348247  
R/Kieffer, B.L.; Belfort, K.; Gaveriaux-Ruff, C.; Hirth, C.G.  
Submitted to the EMBL Data Library, February 1993  
A/Accession: A48227  
A/Status: preliminary  
A/Molecule type: mRNA  
A/Residues: 1-372 <K18>  
A/Cross-references: EMBL:U06322; NID:9192942; PIDN:AAA3752.1; PID:9192943  
R/Badega, T.; Chin, H.; Kim, H.; Jung, H.H.; Kozak, C.A.; Klee, W.A.  
Proc. Natl. Acad. Sci. U.S.A. 90, 9305-9309, 1993  
A/Title: Regional expression and chromosomal localization of the delta opiate receptor g  
A/Reference number: A48685; MUID:94022364; PMID:8415697  
A/Accession: A48685  
A/Status: preliminary  
A/Molecule type: mRNA  
A/Residues: 8-372 <BD>  
A/Cross-references: GB:866181; NID:9435781; PIDN:AAB28546.1; PID:9435782  
A/Experimental sources: NG108-15 hybrid cells  
A/Note: sequence extracted from NCBI backbone (NCBI:138618, NCBIP:138619)  
R/Kieffer, B.L.; Belfort, K.; Gaveriaux-Ruff, C.; Hirth, C.G.  
Proc. Natl. Acad. Sci. U.S.A. 89, 12048-12052, 1992  
A/Title: The delta-opioid receptor: isolation of a cDNA by expression cloning and pharm  
A/Reference number: S36745; MUID:93101664; PMID:1334555  
A/Accession: S36745  
A/Molecule type: mRNA  
A/Residues: 1-189; N 191, CMOV, 207-208, 'ACSSSPVQLVL', 210-372 <K18>  
A/Cross-references: EMBL:U06322  
C/Superfamily: vertebrate rhodopsin  
C/Keywords: Brain; G protein-coupled receptor; glycoprotein; phosphoprotein; transmembrane

Query Match 54.1%; Score 1146.5; DB 2; Length 372;  
Best Local Similarity 61.9%; Pred. No. 5.9e-89;  
Matches 226; Conservative 39; Mismatches 91; Indels 9; Gaps 3;

QY 16 PLAAQSCSPARGSWL-NLSHVDGNQSDPCGLNRGLGG--NDSLCPTGSPGSMVTAITIM 75  
DB 5 PGNARLQSSP--LVNLSDAFPSPAGANAGSGPGRS-----ASSLALAIATLY 56

QY 76 STVCVGLFQNFPLVMTVIVYVTKMTATNIYIPNLALADALATSLPFSQSVNYLMQT 135  
DB 57 SAVCVGLFQNFPLVMTVIVYVTKMTATNIYIPNLALADALATSLPFSQSVNYLMQT 116

QY 136 GTILCKIVISIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPTPRNAKIVNVCNM 195  
DB 117 GBLCKAVLSIDYNNMPTSIPTLCTNSVDRIYAVCHPVKALDPTPRNAKIVNVCNM 176

QY 196 SAIGLPVMPKATTVYQ--GSIDCTLFSHPTM--YENLXICVETPARIMPLIITVCLM 255  
DB 177 SGVGPVMPKATTVYQ--GSIDCTLFSHPTM--YENLXICVETPARIMPLIITVCLM 236

QY 256 ILRLKSVMLSGSKERDNRIRTRVVLVAVVAVVCTVPIHVIKALITIP 314  
DB 237 LLRLKSVMLSGSKERDNRIRTRVVLVAVVAVVCTVPIHVIKALITIP 296

QY 315 TVSHMPCIALGYTNSCLNPLVYAPLDENPFCRPFCTPTSTISQONSTRVRON 374  
DB 297 VAAHLCLTALGYTNSCLNPLVYAPLDENPFCRPFCTPTSTISQONSTRVRON 356

QY 375 STANT 379  
DB 357 VTACT 361

RESULT 9  
A55259  
kappa opioid receptor - guinea pig



20-June-2000

Text\_change 19-May-2000  
Takeuchi, T.  
for the mouse kappa-opioid, rec

## RESULT 14





CONFLICT	237	217	P --> G (IN REP. 5).
CONFLICT	245	245	V --> T (IN REP. 3).
CONFLICT	387	391	LENLE --> KVLVP (IN REP. 8).
SEQUENCE	398 AA;	44494 MM;	9C916D87C1C33743 CRC64;
Query Match	100.0%;	Scor4, 2110;	DB 1; Length 398;
Best Local Similarity	99.7%;	Prod. No. 1.1e-126;	
Matches 397;	Conservative	1; Mismatches	0; Indels
0; Gaps	0; Gaps		
1 MDSBTGDTGSDSDPLAAGSCSPARGSWLNSHVQDSDPGLNLTGLGDSLC	60		
1 MDSBTGDTGSDSDPLAAGSCSPARGSWLNSHVQDSDPGLNLTGLGDSLC	60		
61 GSPSMVTAITMALYSIVCVGLFGNPLVYVYVYRTTKTATNTIYIFNLADA	120		
61 GSPSMVTAITMALYSIVCVGLFGNPLVYVYVYRTTKTATNTIYIFNLADA	120		
121 LPQSVNYLWGTGPPGTILCKIVISIDYVYNNPSTIFITCTNSVDYRYI	180		
121 LPQSVNYLWGTGPPGTILCKIVISIDYVYNNPSTIFITCTNSVDYRYI	180		
181 PRNKKIYVNCWILSSAIGLPLVPMATTKYRGSSIDCTLTFSHPYVY	240		
181 PRNKKIYVNCWILSSAIGLPLVPMATTKYRGSSIDCTLTFSHPYVY	240		
241 FMPILIIITCYGLMILRLKSLVRMLSGSKEDKRLARITRNLVVAVFV	300		
241 FMPILIIITCYGLMILRLKSLVRMLSGSKEDKRLARITRNLVVAVFV	300		
301 IIKALITIPSTTFCVSMHFCALGYNSCLNPVLVDENPKRCRBCPISST	360		
301 IIKALITIPSTTFCVSMHFCALGYNSCLNPVLVDENPKRCRBCPISST	360		
361 QNSTVRQNTREHPSTANTVDRTNHOLENLEAETPLP	398		
361 QNSTVRQNTREHPSTANTVDRTNHOLENLEAETPLP	398		
STANDARD;	PRT;	398 AA.	
01-NOV-1995 (Rel. 32, Created)			
01-NOV-1995 (Rel. 32, Last sequence update)			
15-JUL-1998 (Rel. 36, Last annotation update)			
Mu-type opioid receptor (MOR-1).			
OPRM1 OR OPRM OR MOR.			
Mus musculus (Mouse)			
Karakaya, B. S. (1994)			
NCBI Taxid=10090.			
(1)			
SEQUENCE FROM N.A.			
STRAIN=C57BL/6; TISSUE=Liver;			
MEDLINE=94377496; PubMed=8050773;			
Min B.H., Augustin L.B., Felsheim R.P., Fuchs J.A., Moh H.H.			
"Genomic structure analysis of promoter sequence of mouse mu opioid			
receptor gene."			
J. Neurochem. 61:100-106 (1993).			
(2) Gen. Natl. Acad. Sci. U.S.A. 91:9081-9085 (1994).			
SEQUENCE FROM N.A.			
TISSUE=Brain;			
MEDLINE=95377399; PubMed=7649256;			
Rossi G.C., Pan Y.X., Brown G.P., Pasternak G.W.;			
"Antisense mapping the MOR-1 opioid receptor: evidence for			
alternative splicing and a novel morphine-6 beta-glucuronide			
receptor."			
FEBS Lett. 369:192-196 (1995).			
SEQUENCE FROM N.A.			
TISSUE=Brain;			
MEDLINE=95318164; PubMed=777593;			
Kaufman D.L., Keith D.E., Anton B., Tian J., Magendzo K.;			









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Db 61 PPTGSPNTATIMALYSIVCVGLPQNPVLYVRYVYTRKATATNIIYFNALADALA 120
Qy 118 TSTLPQSVNYLQGTMPPTGTLCKIVISIDYTNMPTSIPTLCTNSVDVRYAVCHPVVALD 177
Db 121 TSTLPQSVNYLQGTMPPTGTLCKIVISIDYTNMPTSIPTLCTNSVDVRYAVCHPVVALD 180
Qy 178 PTPRPNKAKINVCNMISSAIGLVPMPMATTKYRQSGIDCTLTFSHTPTWYENLLKICVP 237
Db 181 PTPRPNKAKINVCNMISSAIGLVPMPMATTKYRQSGIDCTLTFSHTPTWYENLLKICVP 240
Qy 238 IPAPMPPLIITVCYGLMILRLKSLKSGEKDNRRLRITRMVLVAVFVVCVPTPIH 297
Db 241 IPAPMPPLIITVCYGLMILRLKSLKSGEKDNRRLRITRMVLVAVFVVCVPTPIH 300
Qy 298 IYVVIKALITIPPTPTQVSMHFCIALGYNSCLNPVLYAFDENPKRCPRFCPTPSST 357
Db 301 IYVVIKALITIPPTPTQVSMHFCIALGYNSCLNPVLYAFDENPKRCPRFCPTPSST 360
Qy 358 IQQNSTVRQNTREHSTANTVDRTHOLENLEATPLP 398
Db 361 IQQNSTVRQNTREHSTANTVDRTHOLENLEATPLP 401

RESULT 6
ID OPRD HUMAN STANDARD; PRT; 401 AA.
AC P79350.
DT 15-JUL-1998 (Rel. 36, Created)
DT 15-JUL-1999 (Rel. 38, Last sequence update)
DT 15-JUN-2002 (Rel. 41, Last annotation update)
DE Delta-type opioid receptor (MOR-1).
GN OPRM1.
OS Bos taurus (Bovine).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovidae;
OC Bovidae; Bovinae; Bos.
NCBI_TaxID=9913;
PP SEQUENCE FROM N.A.
RX MEDLINE=20050861; PubMed=10581406;
RA Onophrisvilli I., Andria M.L., Villan P.S., Miller J.M., Simon E.J.;
RT "The bovine mu-opioid receptor: cloning of cDNA and pharmacological
RL characterization of the receptor expressed in mammalian cells."
RL Brain Res. Mol. Brain Res. 73:129-137(1999).
CC -1- FUNCTION: INHIBITS NEUROTRANSMITTER RELEASE BY REDUCING CALCIUM
CC ION CURRENTS AND INCREASING POTASSIUM ION CONDUCTANCE. RECEPTOR
CC FOR BETA-ENDORPHIN.
CC -1- SUBCELLULAR LOCATION: Integral membrane protein.
CC -1- SIMILARITY: BELONGS TO FAMILY 1 OF G-PROTEIN COUPLED RECEPTORS.
CC -----
CC This SWISS-PROT entry is copyright. It is produced through a collaboration
CC between the Swiss Institute of Bioinformatics and the EMBL outstation -
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CC or send an email to license@ebi.ac.uk.)
CC -----
DR EMBL; U09677.2; -
DR IncePro; P800276; GPCR_Rhodopsin.
DR PIR; P800276; GPCR_Rhodopsin.
DR PRINTS; P80027; GPCRHOODPSN.
DR PROSITE; P80027; G PROTEIN RECEPTOR P1.1; 1.
DR PROSITE; P85042; G PROTEIN RECEPTOR P1.2; 1.
DR G-protein coupled receptor; Transmembrane; Glycoprotein;
KW Phosphorylation; Lipoprotein; Palmitate.
FT DOMAIN 1 67 EXTRACELLULAR (POTENTIAL).
FT TRANSHEM 68 97 1 (POTENTIAL).
FT TRANSHEM 98 106 CYTOPLASMIC (POTENTIAL).
FT TRANSHEM 107 124 2 (POTENTIAL).
FT TRANSHEM 125 146 EXTRACELLULAR (POTENTIAL).

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FT TRANSHEM 147 166 3 (POTENTIAL).
FT DOMAIN 167 196 CYTOPLASMIC (POTENTIAL).
FT TRANSHEM 197 212 4 (POTENTIAL).
FT DOMAIN 213 237 EXTRACELLULAR (POTENTIAL).
FT TRANSHEM 238 260 5 (POTENTIAL).
FT DOMAIN 261 283 6 (POTENTIAL).
FT TRANSHEM 284 306 6 (POTENTIAL).
FT DOMAIN 307 314 7 (POTENTIAL).
FT TRANSHEM 315 331 7 (POTENTIAL).
FT DOMAIN 332 401 7 (POTENTIAL).
FT TRANSHEM 354 354 7 (POTENTIAL).
FT LIPID 354 354 PALMITATE (POTENTIAL).
FT CARBOHYD 32 12 N-LINKED (GLCNAC...); (POTENTIAL).
FT CARBOHYD 34 34 N-LINKED (GLCNAC...); (POTENTIAL).
FT CARBOHYD 41 41 N-LINKED (GLCNAC...); (POTENTIAL).
FT CARBOHYD 49 49 N-LINKED (GLCNAC...); (POTENTIAL).
SQ SEQUENCE 401 AA; 45027 MW; 6DA8592F29295C6E CRC64;

Query Match 92.3%; Score 1949.5; DB 1; Length 401;
Best Local Similarity 91.5%; Pred. No. 1.56-116;
Matches 367; Conservative 12; Mismatches 19; Indels 3; Gaps 2;

Qy 1 HQSTGPTQNTSCDPLAQ-ASGSA--FGSLKLSHVDQSDPGLNRTGLGNDSLC 57
Db 1 HQSGAVPTNASCTDPTTPHSGSPAPSPSSVWVPSLGNLSDPCGNRTLAGSDRLC 60
Qy 58 POCSPSPMTATITMALYSIVCVGLPQNPVLYVRYVYTRKATATNIIYFNALADALA 117
Db 61 PSAGSPSMTATITMALYSIVCVGLPQNPVLYVRYVYTRKATATNIIYFNALADALA 120
Qy 118 TSTLPQSVNYLQGTMPPTGTLCKIVISIDYTNMPTSIPTLCTNSVDVRYAVCHPVVALD 177
Db 121 TSTLPQSVNYLQGTMPPTGTLCKIVISIDYTNMPTSIPTLCTNSVDVRYAVCHPVVALD 180
Qy 178 PTPRPNKAKINVCNMISSAIGLVPMPMATTKYRQSGIDCTLTFSHTPTWYENLLKICVP 237
Db 181 LPTPRPNKAKINVCNMISSAIGLVPMPMATTKYRQSGIDCTLTFSHTPTWYENLLKICVP 240
Qy 238 IPAPMPPLIITVCYGLMILRLKSLKSGEKDNRRLRITRMVLVAVFVVCVPTPIH 297
Db 241 IPAPMPPLIITVCYGLMILRLKSLKSGEKDNRRLRITRMVLVAVFVVCVPTPIH 300
Qy 298 IYVVIKALITIPPTPTQVSMHFCIALGYNSCLNPVLYAFDENPKRCPRFCPTPSST 357
Db 301 IYVVIKALITIPPTPTQVSMHFCIALGYNSCLNPVLYAFDENPKRCPRFCPTPSST 360
Qy 358 IQQNSTVRQNTREHSTANTVDRTHOLENLEATPLP 398
Db 361 IQQNSTVRQNTREHSTANTVDRTHOLENLEATPLP 401

RESULT 7
ID OPRD HUMAN STANDARD; PRT; 372 AA.
AC P41433.
DT 01-SEP-1995 (Rel. 31, Created)
DT 15-JUL-1998 (Rel. 36, Last sequence update)
DT 15-JUN-2002 (Rel. 41, Last annotation update)
DE Delta-type opioid receptor (DOR-1).
GN OPRD1 OR OPR4 (human).
OS Homo sapiens (human).
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
PP SEQUENCE FROM N.A.
RX TISSUE=Brain cortex, and Striatum;
RX MEDLINE=94260835; PubMed=8201839;
RA Knapp R.J., Kalatynska E., Fang L., Li X., Babin E., Nguyen M.,
RA Santoro G., Varpa E.V., Hruby V.J., Roache W.R., Fendler H.J.;
RT Identification of a human delta opioid receptor: Cloning and
RT expression.
RL Life Sci. 54:PL463-PL469(1994).

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Db 295 LVEALGSHSTHVAISSYFCIALGNTNSLNPVLPDENPKRCDFCFPIKRMERQ 354
Oy 361 QNSTRVQTRHPSTANTYDRTN 384
Db 355 STNRVR-NTVQDPASHRDVGQGN 377

RESULT 13
OPRK_MOUSE STANDARD; PRT: 380 AA.
ID AC P31534
DT 01-FEB-1994 (Rel. 28, Created)
DT 01-FEB-1994 (Rel. 28, Last sequence update)
DT 16-OCT-2001 (Rel. 40, Last annotation update)
DE Kappa-type opioid receptor (OPR-1) (MOL-I).
GN OPRK1
OR Mus musculus (Mouse).
OC Eukarya; Metazoa; Chordata; Craniata; Vertebrata; Eucelostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Mus.
OC NCBI_TaxID=10090;
RN [1]
RP SEQUENCE FROM N.A.
RC MEDLINE=93342664; PubMed=89393575;
RA Sell G.I.;;
RA Yeuda K.; Raynor K.; Kong H.; Brader C.D.; Takeda J.; Reisine T.;
RT Cloning and functional comparison of kappa and delta opioid
RT receptor from mouse brain;
RL Proc. Natl. Acad. Sci. U.S.A. 90:6736-6740(1993).
RN [2]
RP SEQUENCE FROM N.A.
RC MEDLINE=95100967; PubMed=7802669;
RA Nishi M.; Takashima H.; Mori M.; Nakagawa K.I.; Takeuchi T.;
RT Structure and chromosomal mapping of genes for the mouse
RT kappa-opioid receptor and an opioid receptor homologue (MOR-C);
RL Biochem. Biophys. Res. Commun. 205:1353-1357(1994).
RN [3]
RP SEQUENCE FROM N.A.
RC MEDLINE=95251663; PubMed=7731933;
RA Liu H.H.; Augustin L.B.; Felleheim R.P.; Chen H.C.;
RA L.H.H.; Wei L.N.;
RT Cloning and promoter mapping of mouse kappa opioid receptor gene.;
RL Biochem. Biophys. Res. Commun. 209:639-647(1995).
RN [4]
RP SEQUENCE FROM N.A.
RC MEDLINE=96084989; PubMed=7499487;
RA Belkowski S.M.; Zhu J.; Liu-Chen L.Y.; Eisenstein T.K.;
RA Adler M.M.; Rogers T.J.;
RT Sequence of kappa-opioid receptor cDNA in the R1.1 thymoma cell
RT line.;
RL J. Neuroimmunol. 62:113-117(1995).
CC -1- ION CURRENTS AND INCREASING POTASSIUM RELEASE BY REDUCING CALCIUM
CC FOR DYNORPHINS MAY PLAY A ROLE IN AROUSAL AND REGULATION OF
CC AUTONOMIC AND NEUROENDOCRINE FUNCTIONS.
CC -1- SUBCELLULAR LOCATION: BRAIN (NEOCORTEX, HIPPOCAMPUS, AMYGDALA,
CC MEDIAL HABENULA, HYPOTHALAMUS, LOCUS CERULEUS, AND PARABRACHIAL
CC NUCLEUS).
CC -1- SIMILARITY: BELONGS TO FAMILY 1 OF G-PROTEIN COUPLED RECEPTORS.
CC
CC THIS SWISS-PROT entry is copyrighted. It is produced through a collaboration
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CC or send an email to license@isb-eb.ch).
CC
CC EMBL; L11065; AAA32963.1;
CC DR EMBL; D31665; BAA06508.1; JOINED.
CC DR EMBL; D31663; BAA06508.1; JOINED.
CC DR EMBL; D31664; BAA06508.1; JOINED.

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DR EMBL; S77872; AAB34130.2;
DR EMBL; S77869; AAB34130.2; JOINED.
DR EMBL; S81111; -. NOT_ANNOTATED_CDS.
DR PIR; A48227; A48227.
DR MGI; MGI:174339; OPRK1.
DR InterPro; IPR000276; GPCR_Rhodopsin.
DR InterPro; IPR000832; GPCR_secretin.
DR Pfam; PF00001; 7tm1; 1.
DR PRINTS; PRO0237; GPCR_RHODOPSIN.
DR PROSITE; PS00237; G-PROTEIN_RECEP_F1_1;
DR PROSITE; PS00262; G-PROTEIN_RECEP_F1_1;
KW G-protein coupled receptor; 7 transmembrane; Glycoprotein;
KW Palmitate; Lipid; Lipophilic; EXTRACELLULAR (POTENTIAL).
FT DOMAIN 59 85
FT TRANSHEM 59 85
FT TRANSHEM 86 95
FT TRANSHEM 96 117
FT TRANSHEM 118 132
FT TRANSHEM 133 154
FT TRANSHEM 155 173
FT TRANSHEM 174 196
FT TRANSHEM 197 222
FT TRANSHEM 223 248
FT TRANSHEM 249 275
FT TRANSHEM 276 299
FT TRANSHEM 300 311
FT TRANSHEM 312 333
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-|- SURCELLULAR LOCATION; Integral membrane protein.
-|- TISSUE SPECIFICITY; HIGHLY EXPRESSED IN SEVERAL BRAIN AREAS.
-|- SIMILARITY; BELONGS TO FAMILY 1 OF G-PROTEIN COUPLED RECEPTORS.

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EMBL; D16438; BAA03908.1; -
EMBL; U05239; AAA16201.1; -
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EMBL; L28144; AAC37661.1; -
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PIR; S46238; S46238.1; -
PIR; S43655; S43655.
PSS; P34996; IDD.
InterPro; IPRO00276; GPCR_Rhodopsin.
Pfam; PF00001; 7cm.1; 1.
PRINTS; PR00217; GPCRHODOPSIN.
PROSITE; PS00337; G_PROTEIN_RECSP_F1_1; 1.
PROSITE; PS00362; G_PROTEIN_RECSP_F1_2; 1.
G-protein coupled receptor; Transmembrane; glycoprotein; Phosphorylation; Lipoprotein; Extracellular (POTENTIAL).
Transmembrane 48 74
CYTOPLASMIC (POTENTIAL).
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EXTRACELLULAR (POTENTIAL).
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PALMITATE (POTENTIAL).
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L -- V (IN REP. 2)
G -- Y (IN REP. 2)
E -- P (IN REP. 3)
S -- T (IN REP. 3)
SEQUENCE 367 AA; 40523 MW; BB263758274784AD CRC64;

Query Match 46.3%; Score 977; DB 1; Length 367;
Best Local Similarity 52.2%; Pred. No. 3.4e-55;
Matches 201, Conservative 46; Mismatches 110; Indels 28; Gaps

2 SCSPARGSW--LNLSHVGQNSDPCGLNRFG-----LCGNDSICDPTSGSVMTAITINA 73
3 SLFPAP-YMEVLVYGSHPQNLS---LLNETVPHELLNLNASHAPSFLPG-----LKVTIVG 53

74 LVSHVCVGVGFNFVWTVYRVYTOKTKATNIYIPFNLAADAATSTLPFOSVNTLVGMT 133
54 LYLVAVTCVGLGCNCNVVIRHTOKTKATNIYIPFNLAADTVLTVPFGQDITLVGM 113
134 PRTTLCKVIVSIDYNPSIFSLCTWSVDYNTANCVHVALDRTPDPKAVIYCNVKH 193
114 PPNALCNTVIALDYIMFTSTITLANSVDYVAICIEBALDVTSNQAQVNVMAIA 173
194 LSSAGLGVPHVNPAATKYRGSDICTLTFSPHPTWMHMLUKVICVPIPAIPILITVCYG 253

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Search completed: March 25, 2003, 09:56:32  
Job time : 19 secs



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Db 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVYVRYTQKATNIYIFNLALADALATST 120
Qy 121 LPQSVNYLQMTWPPGTLCKIVISIDYNNMFTSIPTLCTMSVDRIYACHPVKALDPT 180
Db 121 LPQSVNYLQMTWPPGTLCKIVISIDYNNMFTSIPTLCTMSVDRIYACHPVKALDPT 180
Qy 181 PNNAKIVVNCWILSSAIGLVPWPMATTKYRQSGIDCTLTSPHTWYNNLLKICVPIFA 240
Db 181 PNNAKIVVNCWILSSAIGLVPWPMATTKYRQSGIDCTLTSPHTWYNNLLKICVPIFA 240
Qy 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
Db 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
Qy 301 IKALITPITPTFQTVSMHFCIALGCVNLSYAPLVDENKPCREPCIPSTSTIEQ 360
Db 301 IKALITPITPTFQTVSMHFCIALGCVNLSYAPLVDENKPCREPCIPSTSTIEQ 360
Qy 361 QNSRTRVONTREHPSTANTVORTNHOLES 393
Db 361 QNSRTRVONTREHPSTANTVORTNHOLESQ 393

RESULT 2
QSVIYI PRELIMINARY; PRT; 390 AA.
ID QSVIYI
AC QSVIYI
DT 01-MAR-2002 (TrEMBLrel. 20, Created)
DT 01-MAR-2002 (TrEMBLrel. 20, Last sequence update)
DT 01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
DE Mu opiod receptor variant A.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Mus.
OX NCBI_TaxID=10090;
RN [1]
RC SEQUENCE FROM N.A.
RA Pan Y.-X., Xu J., Chang A., Pasternak G.W.,
MEDLINE=20145060; PubMed=10682855;
RX Pan Y.-X., Xu J., Bolen E., Chang A., Mahurter L., Rossi G.,
RA Pasternak G.W.,
RT "Isolation and expression of a novel alternatively spliced mu opiod
RT receptor isoform, MOR-1P."
RL FEBS Lett. 466:337-340(2000).
CC -1- SUBCELLULAR LOCATION: INTEGRAL MEMBRANE PROTEIN (BY SIMILARITY).
CC -1- SIMILARITY: BELONGS TO FAMILY 1 OF G-PROTEIN COUPLED RECEPTORS.
DR EMBL; AP167568; AAF79213.1; -.
DR MGI; MGI:197411; Opmr.
DR RefSeq; R000276; 1.
DR PIR; P00001; 7.
DR PRINTS; PR00237; GPCR_RHODOPSIN.
DR PROSITE; PS00237; G_PROTEIN_RECP_F1_1; 1.
DR PROSITE; PS00262; G_PROTEIN_RECP_F1_2; 1.
KW G-protein coupled receptor; Glycoprotein; Receptor; Transmembrane.
SQ SEQUENCE 390 AA; 43563 MW; 69586A686C255294 CRC64;

Query Match 94.9%; Score 2004; DB 11; Length 390;
Best Local Similarity 97.3%; Pred. No. 4,36-173;
Matches 376; Conservative 4; Mismatches 7; Indels 0; Gaps 0;

Qy 1 MDSBAGPQNIIDSCDPLAPASCSPAPGSMNLNLSHVDGQSDPCPNRTGLGSHSLCPOT 60
Db 1 MDSBAGPQNIIDSCDPLAPASCSPAPGSMNLNLSHVDGQSDPCPNRTGLGSHSLCPOT 60
Qy 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVYVRYTQKATNIYIFNLALADALATST 120
Db 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVYVRYTQKATNIYIFNLALADALATST 120
Qy 121 LPQSVNYLQMTWPPGTLCKIVISIDYNNMFTSIPTLCTMSVDRIYACHPVKALDPT 180
Db 121 LPQSVNYLQMTWPPGTLCKIVISIDYNNMFTSIPTLCTMSVDRIYACHPVKALDPT 180
Qy 181 PNNAKIVVNCWILSSAIGLVPWPMATTKYRQSGIDCTLTSPHTWYNNLLKICVPIFA 240
Db 181 PNNAKIVVNCWILSSAIGLVPWPMATTKYRQSGIDCTLTSPHTWYNNLLKICVPIFA 240
Qy 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
Db 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
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Db 181 PNNAKIVVNCWILSSAIGLVPWPMATTKYRQSGIDCTLTSPHTWYNNLLKICVPIFA 240
Qy 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
Db 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
Qy 301 IKALITPITPTFQTVSMHFCIALGCVNLSYAPLVDENKPCREPCIPSTSTIEQ 360
Db 301 IKALITPITPTFQTVSMHFCIALGCVNLSYAPLVDENKPCREPCIPSTSTIEQ 360
Qy 361 QNSRTRVONTREHPSTANTVORTNHOLES 387
Db 361 QNSRTRVONTREHPSTANTVORTNHOVS 387

RESULT 3
QSVIYI PRELIMINARY; PRT; 444 AA.
ID QSVIYI
AC QSVIYI
DT 01-OCT-2000 (TrEMBLrel. 15, Created)
DT 01-OCT-2000 (TrEMBLrel. 15, Last sequence update)
DT 01-JUN-2002 (TrEMBLrel. 21, Last annotation update)
DE Mu opiod receptor variant P.
OS Mus musculus (Mouse).
OC Eukaryota; Metazoa; Chordata; Vertebrata; Euteleostomi;
OC Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Mus.
OX NCBI_TaxID=10090;
RN [1]
RC SEQUENCE FROM N.A.
RA MEDLINE=20145060; PubMed=10682855;
RX Pan Y.-X., Xu J., Bolen E., Chang A., Mahurter L., Rossi G.,
RA Pasternak G.W.,
RT "Isolation and expression of a novel alternatively spliced mu opiod
RT receptor isoform, MOR-1P."
RL FEBS Lett. 466:337-340(2000).
CC -1- SUBCELLULAR LOCATION: INTEGRAL MEMBRANE PROTEIN (BY SIMILARITY).
CC -1- SIMILARITY: BELONGS TO FAMILY 1 OF G-PROTEIN COUPLED RECEPTORS.
DR EMBL; AP167568; AAF79213.1; -.
DR MGI; MGI:197411; Opmr.
DR RefSeq; R000276; 1.
DR PIR; P00001; 7.
DR PRINTS; PR00237; GPCR_RHODOPSIN.
DR PROSITE; PS00237; G_PROTEIN_RECP_F1_1; 1.
DR PROSITE; PS00262; G_PROTEIN_RECP_F1_2; 1.
KW G-protein coupled receptor; Glycoprotein; Receptor; Transmembrane.
SQ SEQUENCE 444 AA; 49094 MW; B013B108E8BDC782 CRC64;

Query Match 94.9%; Score 2004; DB 11; Length 444;
Best Local Similarity 92.5%; Pred. No. 56-173;
Matches 381; Conservative 4; Mismatches 9; Indels 18; Gaps 1;

Qy 1 MDSBAGPQNIIDSCDPLAPASCSPAPGSMNLNLSHVDGQSDPCPNRTGLGSHSLCPOT 60
Db 1 MDSBAGPQNIIDSCDPLAPASCSPAPGSMNLNLSHVDGQSDPCPNRTGLGSHSLCPOT 60
Qy 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVYVRYTQKATNIYIFNLALADALATST 120
Db 61 GSPSMVTATITMALYSIVCVGLPGNPLVMVYVRYTQKATNIYIFNLALADALATST 120
Qy 121 LPQSVNYLQMTWPPGTLCKIVISIDYNNMFTSIPTLCTMSVDRIYACHPVKALDPT 180
Db 121 LPQSVNYLQMTWPPGTLCKIVISIDYNNMFTSIPTLCTMSVDRIYACHPVKALDPT 180
Qy 181 PNNAKIVVNCWILSSAIGLVPWPMATTKYRQSGIDCTLTSPHTWYNNLLKICVPIFA 240
Db 181 PNNAKIVVNCWILSSAIGLVPWPMATTKYRQSGIDCTLTSPHTWYNNLLKICVPIFA 240
Qy 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
Db 241 FIMPVLIIITVCYGLMILRLKSVRLMSGSKENKDNLRIRTRMVLVAVVIVCWTPIHIY 300
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Qy 119 STLPQSQVNYLQCTWPGFTLLCKIVISIDYNNPST;PTLCTNSVDVYVIANCHPVALDP 179
Db 183 STLPQSQVNYLQCTWPGFTLLCKIVISIDYNNPST;PTLCTNSVDVYVIANCHPVALDP 242
Qy 179 RTPRNAKI VNVNCNWLISSAIGLGPWPMATKTKYRQSGIDCTLTFSHPYVWBNLKLKIVPI 238
Db 243 RTPRNAKI VNVNCNWLISSAIGLGPWPMATKTKYRQSGIDCTLTFSHPYVWBNLKLKIVPI 302
Qy 239 PAFZPFIILITVYCVGLMILRLKLSVRLMKSSEKDNRLRIRTRMVLVVAVTVICWPTIHI 298
Db 303 PAFZPFIILITVYCVGLMILRLKLSVRLMKSSEKDNRLRIRTRMVLVVAVTVICWPTIHI 362
Qy 299 YVLIKALITIPRTTFTVLSVSHCAITVGLNSCLNPLVYAFLDENPNCVPRPFCPTSSTI 356
Db 363 YVLIKALITIPRTTFTVLSVSHCAITVGLNSCLNPLVYAFLDENPNCVPRPFCPTSSNI 422
Qy 359 EQONSTRVQNRTEHPSTANTVDRTNRLQNL 390
Db 423 EQONSTRVQNRTEHPSTANTVDRTNRLQNL 454
RESULT 10
IC GVPI PRELIMINARY; PRT; 330 AA.
AC GVPI;
DT 01-MAR-2002 (TRENBLrel. 20. Created)
DT 01-MAR-2002 (TRENBLrel. 20. Last sequence update)
DT 01-JUN-2002 (TRENBLrel. 21. Last annotation update)
DB MOR-10.
GN MOR-10.
GN OPRM.
OC Mus musculus (Mouse)
OC Eukaryota; Metazoa; Chordata; Craniata; Vertebrate; Euteleostomi;
OC Actinoptera; Euteleostomi; Actinoptera; Actinoptera; Actinoptera;
OC NCBI_Taxid=10096.
RN [1]
RC SEQUENCE FROM N.A.
RP STRAIN=C57BL/6;
RX MEDLINE=21574637; PubMed=11717463;
RA Pan Y.X., Xu J., Muhetur L., Bolan S., Xu M., Pasternak G.W.;
RT "Generation of the mu opioid receptor (MOR-1) protein by three new
RT splice variants of the Oprm gene."
RL Proc. Natl. Acad. Sci. U.S.A. 98:14084-14089 (2001).
RL EMBL; AF062755; AACJ4927.1; ".
DR MGI; MGI:97441; GDB; GDB:10076.
DR GPCF; GPCF:10076.1; GPCF_Rhodopsin.
DR GPCF; GPCF:10076.1; GPCF_Rhodopsin.
DR PROSITE; PS00237; GPCR_HODOPSIN.
DR PROSITE; PS00237; G. PROTEIN RECP FL 1; UNKNOWN 1.
DR PROSITE; PS00262; G. PROTEIN RECP FL 2; 1.
SQ SEQUENCE 330 AA; 37957 MW; EFEP98DA945CFD69 CRC64;
Query Match 75.7%; Score 1597; DB 11; Length 330;
Best Local Similarity 99.4%; Pred. No. 2.3e-136;
Matches 300; Conservative 3; Mismatches 2; Indels 0; Gaps.
Qy 94 VRYTQWNTAKIVYINLADALATSTLPQSQVNYLQCTWPGFTLLCKIVISIDYNNPST 153
Db 26 LRYTQWNTAKIVYINLADALATSTLPQSQVNYLQCTWPGFTLLCKIVISIDYNNPST 95
Qy 154 SIPTLCTNSVDVYVIANCHPVALDPRTPRNAKIVNVNCNWLISSAIGLGPWPMATKTKYRQ 213
Db 86 SIPTLCTNSVDVYVIANCHPVALDPRTPRNAKIVNVNCNWLISSAIGLGPWPMATKTKYRQ 145
Qy 214 SIDCTLTFSHPYVWBNLKLKIVPIAFIMPILITVYCVGLMILRLKLSVRLMKSSEKDN 298
Db 146 SIDCTLTFSHPYVWBNLKLKIVPIAFIMPILITVYCVGLMILRLKLSVRLMKSSEKDN 298
Qy 274 NLRRTITWVNYVAVTVICWPTIHI 362
Db 206 NLRRTITWVNYVAVTVICWPTIHI 362

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Submitted (Feb-2001) to the EMBL/GenBank/DBJ databases.  
 DR ENBL; AP147691; AAC24465.1; .  
 DR ENBL; AJ708511; CAC83776.1; .  
 DR InterPro: IPR000276; GPCR\_Rhodopsin.  
 DR Pfam: PF00001; 7tm.1.1.  
 DR PROSITE; PS00237; G-PROTEIN RECEPTOR FL1; UNKNOWN\_1.  
 DR PROSITE; PS0262; G-PROTEIN RECEPTOR FL2; 1.  
 KW Neceptor.  
 FT NON-TER.  
 PT NON-TER.  
 SQ SEQUENCE 291 AA; 33490 MW; 43707615CAAD47 CRC64;  
 Query Match 72.5%; Score 1511; DB 11; Length 291;  
 Best Local Similarity 98.6%; Pred. No. 1.9e-130;  
 Matches 287; Conservative 2; Mismatches 2; Indels 0; Gaps 0;  
 QY 96 YTKTKATNIYIPNLADALATSTLPQSVNTLGTWPPGTLCKIVISIDYNTFTSI 155  
 DB 1 YTKTKATNIYIPNLADALATSTLPQSVNTLGTWPPGTLCKIVISIDYNTFTSI 60  
 QY 156 YTKTKATNIYIPNLADALATSTLPQSVNTLGTWPPGTLCKIVISIDYNTFTSI 215  
 DB 1 YTKTKATNIYIPNLADALATSTLPQSVNTLGTWPPGTLCKIVISIDYNTFTSI 60  
 QY 61 PTLCTSVDRYIAVCHPVKALDPRTRNKKVNVNCLSSAIGLWFWPATTKRQSI 120  
 DB 1 PTLCTSVDRYIAVCHPVKALDPRTRNKKVNVNCLSSAIGLWFWPATTKRQSI 120  
 QY 216 DCLTLTSPHTWYENLKKICVPIFAPILPILITVCYGLMLRLKSVMLSGSKEDKRL 275  
 DB 1 DCLTLTSPHTWYENLKKICVPIFAPILPILITVCYGLMLRLKSVMLSGSKEDKRL 275  
 QY 121 DCLTLTSPHTWYENLKKICVPIFAPILPILITVCYGLMLRLKSVMLSGSKEDKRL 180  
 DB 1 DCLTLTSPHTWYENLKKICVPIFAPILPILITVCYGLMLRLKSVMLSGSKEDKRL 180  
 QY 276 RRITRNLVYVAVFVCMPTPIHIVYIKALITIPETPTQVSMHPCIALGYNSCLNPVL 335  
 DB 1 RRITRNLVYVAVFVCMPTPIHIVYIKALITIPETPTQVSMHPCIALGYNSCLNPVL 335  
 QY 181 RRITRNLVYVAVFVCMPTPIHIVYIKALITIPETPTQVSMHPCIALGYNSCLNPVL 240  
 DB 1 RRITRNLVYVAVFVCMPTPIHIVYIKALITIPETPTQVSMHPCIALGYNSCLNPVL 240  
 QY 336 YAPLDENPKCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEP 386  
 DB 1 YAPLDENPKCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCE 386  
 QY 241 YAPLDENPKCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCE 291  
 DB 1 YAPLDENPKCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCEPCE 291  
 RESULT 14  
 QY 098UH1 PRELIMINARY; PRT; 384 AA.  
 AC 098UH1;  
 DT 01-JUN-2001 (TrEMBLrel. 17, Created)  
 DT 01-JUN-2001 (TrEMBLrel. 17, Last sequence update)  
 DT 01-MAR-2002 (TrEMBLrel. 20, Last annotation update)  
 DE No opitoid receptor-like OR2.  
 OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrate; Euteleostomi;  
 OC Actinopterygii; Neopterygii; Teleostei; Osteiophysi; Cypriniformes;  
 OC Cyprinidae; Danio.  
 OX NCBI\_TaxID=7955;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE=20565716; PubMed=11113526;  
 RA Barralio A., Gonzalez-Sarmiento R., Alvar F., Rodriguez R.E.;  
 RT "EPOR2, a new opitoid receptor-like gene from the teleost zebrafish  
 (Danio rerio).", Brain Res. 841:1-6(2000).  
 CC -1- SIMILARITY: BELONGS TO FAMILY 1 OF G-PROTEIN COUPLED RECEPTORS.  
 DR ENBL; AP132813; AAK01143.1; .  
 DR InterPro: IPR000276; GPCR\_Rhodopsin.  
 DR Pfam: PF00001; 7tm.1.1.  
 DR PRINTS; PR00237; GPCR\_Rhodopsin.  
 DR PROSITE; PS00237; G-PROTEIN RECEPTOR FL1; 1.  
 DR PROSITE; PS0262; G-PROTEIN RECEPTOR FL2; 1.  
 KW G-protein coupled receptor; Glycoprotein; Receptor; Transmembrane.  
 SQ SEQUENCE 384 AA; 43185 MW; 1A376B5DE6D458C CRC64;  
 Query Match 68.6%; Score 1449; DB 13; Length 384;  
 Best Local Similarity 74.3%; Pred. No. 6.6e-123;  
 Matches 289; Conservative 30; Mismatches 52; Indels 18; Gaps 6;

QY 9 NTDCSDPLAQCSPAPSCWMLSHVGNQSDPCLNRTGLGNDSLCPOT-----GSP 63  
 DB 4 NTNISO-LLYALNPMVS---NSSILCRNFSSGL-----VNNSSVCDRTPELKGST 55  
 QY 64 SMYTAITIALYSIVCV--VGLFQPLVWVYVIRYTKTKATNIYIPNLADALATSTL 121  
 DB 56 PVTAIIITIALYSIVCVWMLGVVWVYVIRYTKTKATNIYIPNLADALATSTL 115  
 QY 122 PQSVNYLACTWPPPTILCKIVISIDYNTFTSIPTLCTMSVDRIYAVCHPVKALDPRTP 181  
 DB 116 PQSVNYLACTWPPPTILCKIVISIDYNTFTSIPTLCTMSVDRIYAVCHPVKALDPRTP 175  
 QY 182 RNKKVNVNCLSSAIGLWFWPATTK---YRQSIIDCLTSPHTWYENLKKICVPI 238  
 DB 176 RNKKVNVNCLSSAIGLWFWPATTK---YRQSIIDCLTSPHTWYENLKKICVPI 235  
 QY 239 PAFITPILITVCYGLMLRLKSVMLSGSKEDKRLRIRITRMVLVYVAVFVCMPTPIH 298  
 DB 236 PAFITPILITVCYGLMLRLKSVMLSGSKEDKRLRIRITRMVLVYVAVFVCMPTPIH 295  
 QY 298 YVILKALITIPETPTQVSMHPCIALGYNSCLNPVLAPLDENPKCEPCEPCEPCEP 358  
 DB 296 YVILKALITIPETPTQVSMHPCIALGYNSCLNPVLAPLDENPKCEPCEPCEPCEP 355  
 QY 359 EONSTVRONTREHPTSTANTVDRTNQL 387  
 DB 356 DLNSTRSRNPORDQSSGHTVDRTNOV 384  
 RESULT 15  
 QY 042324 PRELIMINARY; PRT; 383 AA.  
 AC 042324;  
 DT 01-JAN-1998 (TrEMBLrel. 05, Created)  
 DT 01-MAR-2002 (TrEMBLrel. 20, Last sequence update)  
 DT 01-MAR-2002 (TrEMBLrel. 20, Last annotation update)  
 DE Mu-opitoid receptor.  
 OS Eukaryota; Metazoa; Chordata; Craniata; Vertebrate; Euteleostomi;  
 OC Actinopterygii; Neopterygii; Teleostei; Osteiophysi; Cypriniformes;  
 OC Catostomidae; Catostomus.  
 OX NCBI\_TaxID=7971;  
 RN [1]  
 RP SEQUENCE FROM N.A.  
 RX MEDLINE=97368346; PubMed=9223341;  
 RA Barthelemy M.G., Green R., Harvey R.J., Kreienkamp H.J., Stuenkel T.,  
 RT "The mu-opitoid receptor, a member of the G-protein-coupled receptor  
 family, is a member of the mu-opitoid receptor family (Catostomus commersoni):  
 Sequence, pharmacology, coupling to a G-protein-gated inward-  
 rectifying potassium channel (GIRK1), and evolution.",  
 RL Proc. Natl. Acad. Sci. U.S.A. 94:8214-8219(1997).  
 CC -1- SUBCELLULAR LOCATION: INTEGRAL MEMBRANE PROTEIN (BY SIMILARITY).  
 CC -1- SIMILARITY: BELONGS TO FAMILY 1 OF G-PROTEIN COUPLED RECEPTORS.  
 DR ENBL; Y10904; CAA71843.1; .  
 DR InterPro: IPR000276; GPCR\_Rhodopsin.  
 DR Pfam: PF00001; 7tm.1.1.  
 DR PRINTS; PR00237; GPCR\_Rhodopsin.  
 DR PROSITE; PS00237; G-PROTEIN RECEPTOR FL1; 1.  
 DR PROSITE; PS0262; G-PROTEIN RECEPTOR FL2; 1.  
 KW G-protein coupled receptor; Glycoprotein; Receptor; Transmembrane.  
 SQ SEQUENCE 383 AA; 43232 MW; F58838857A107305 CRC64;  
 Query Match 67.0%; Score 1415; DB 13; Length 383;  
 Best Local Similarity 71.9%; Pred. No. 7.8e-120;  
 Matches 284; Conservative 28; Mismatches 63;  
 QY 1 MOSSGTGQWTSQSDPLAQCSPAPSC  
 DB 1 MFTS---GRIAN--  
 QY

Db 50 DNTF-VIIAIIITLISIVCVGLVGNVNVYIIRVTOKTATNIYIFNLADALATS 108  
Qy 120 TLPPQSVNYLNGTNPFGTILCKIVISIDYNNMFTSIFTCTMSVDYIAVCHPVKALDPR 179  
Db 109 TLPPQSVNYLNGTNPFGDVCKIVNSIDYNNMFTSIFTCTMSVDYIAVCHPVKALDPR 168  
Qy 180 TPRXAKIVNVCNMLSSAIGLPWPMATTKTRO-----GSIDCTLPSSHPTMYENLL 232  
Db 169 TPRXAKIVNVCNMLSSAIGLPWPMATTKTRO-----GSIDCTLPSSHPTMYENLL 228  
Qy 233 KICVPIAPIMPILITTCVGLMLRLKSVMLSGSKKORNLARITRMVYVVAVPIVC 292  
Db 229 KICVPIAPIMPILITTCVGLMLRLKSVMLSGSKKORNLARITRMVYVVAVPIVC 288  
Qy 293 WPIHIVYIIKALITIPITPTVQVSWFPCIALQYTNLSCLNPVLYAFDENPKCFRPECI 352  
Db 289 WPIHIVYIIKALITIPITPTVQVSWFPCIALQYTNLSCLNPVLYAFDENPKCFRPECI 348  
Qy 353 PPSSTISQNSSTRVQNTREHSTMTUDRTRQOL 387  
Db 349 PPSVLDLQNSSTRVQNTREHSTMTUDRTRQOL 383

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Job time : 41 seco